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EXAMINER

TORRES, JUAN A

ART UNIT

PAPER NUMBER

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/943,029

Applicant(s)

LEE ET AL.

Examiner

Juan A. Torres

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

In view of the amendment filed on 12/27/2005, the Examiner withdraws claim objections of the previous Office action.

Claim Rejections - 35 USC § 112

In view of the amendment filed on 12/27/2005, the Examiner withdraws claim rejections 35 USC 112 of the previous Office action.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 10-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As per claims 10 and 12, the specification doesn't disclose that the phase of the plurality of sampling clocks are automatically adjustable.

As per claims 11 and 13, they are rejected because they depend from claims 10 and 12 respectively.

Claims 11 and 13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to

one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification doesn't disclose that the time distance between a first-occurring clock of the plurality of clocks and a last-occurring clock of the plurality of clocks is automatically adjustable.

Response to Arguments

Applicant's arguments filed on 12/27/2005 have been fully considered but they are not persuasive.

Regarding claim 1:

The Applicant contends, "neither Bregman nor Hogue teaches "at least a first pseudo-bit error value and a second pseudo-bit error value" and "phase controlling means for estimating the phase relationship between the input data and the plurality of sampling clocks using at least the first pseudo-bit error value and the second pseudo-bit error values.""

The Examiner disagrees and asserts, that, as indicated in the previous office action Hogge discloses providing a first pseudo bit-error signal that is a result of comparison of data sampled at an early boundary with recovered data (figure 3 block 33 column 3 line 60-65); providing a second pseudo bit-error signal that is a result of comparison of data sampled at a late boundary with recovered data (figure 3 block 35 column 3 line 66 to column 4 line 2); and using the first and second pseudo bit-error signals, so that the sampling boundary is marginally matched to the edge of an eye opening and one of the intermediate sampling points serves for data recovery (figure 3 block 51 column 4 lines 3-13).

For these reasons and the reasons indicated in the previous Office action the rejections of claim 1 is maintained.

Regarding claims 2-5:

The Applicant contends, "Claims 2-5 are either directly or indirectly dependent on the independent Claim 1. As described above, the independent Claim 1 is allowable over the teachings of Bregman and Hogue. Accordingly, Claims 2-5 are also at least allowable as being dependent on an allowable claim".

The Examiner disagrees and asserts, that, as indicated in the previous office action, because the rejection of claim 1 is maintained, the rejection of claims 2-5 are also maintained.

For these reasons and the reasons indicated in the previous Office action the rejections of claims 2-5 are maintained.

Regarding claim 6:

The Applicant contends, "neither Bregman nor Hogue teaches "at least a first pseudo-bit error value and a second pseudo-bit error value" and "a phase controller that estimates the phase relationship between the input data and the plurality of sampling clocks using at least the first pseudo-bit error value and the second pseudo-bit error values.""

The Examiner disagrees and asserts, that, as indicated in the previous office action Hogge discloses providing a first pseudo bit-error signal that is a result of comparison of data sampled at an early boundary with recovered data (figure 3 block 33 column 3 line 60-65); providing a second pseudo bit-error signal that is a result of

comparison of data sampled at a late boundary with recovered data (figure 3 block 35 column 3 line 66 to column 4 line 2); and using the first and second pseudo bit-error signals, so that the sampling boundary is marginally matched to the edge of an eye opening and one of the intermediate sampling points serves for data recovery (figure 3 block 51 column 4 lines 3-13).

For these reasons and the reasons indicated in the previous Office action the rejections of claim 6 is maintained.

Regarding claims 7-8:

The Applicant contends, "Claims 7-8 are directly dependent on the independent Claim 6. As described above, the independent Claim 6 is allowable over the teachings of Bregman and Hogue. Accordingly, Claims 7-8 are also at least allowable as being dependent on an allowable claim"

The Examiner disagrees and asserts, that, as indicated in the previous office action, because the rejection of claim 6 is maintained, the rejection of claims 7-8 are also maintained.

For these reasons and the reasons indicated in the previous Office action the rejections of claims 7-8 are maintained.

Regarding claim 9:

The Applicant contends, "neither Bregman nor Hogue teaches "providing a first pseudo bit-error signal from a comparer" and "providing a second pseudo bit-error signal from the comparer.""

The Examiner disagrees and asserts, that, as indicated in the previous office action Hogge discloses providing a first pseudo bit-error signal that is a result of comparison of data sampled at an early boundary with recovered data (figure 3 block 33 column 3 line 60-65); providing a second pseudo bit-error signal that is a result of comparison of data sampled at a late boundary with recovered data (figure 3 block 35 column 3 line 66 to column 4 line 2); and using the first and second pseudo bit-error signals, so that the sampling boundary is marginally matched to the edge of an eye opening and one of the intermediate sampling points serves for data recovery (figure 3 block 51 column 4 lines 3-13).

For these reasons and the reasons indicated in the previous Office action the rejections of claim 9 is maintained.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 9 is rejected under 35 U.S.C. 102(b) as being anticipated by Hogge (US 4218771). Hogge discloses a data recovery method for a digital data stream, comprising sampling input data at multiple points, where the sampling points are arranged by a predetermined order and adjustable time difference (figure 3 block 23 column 3 lines 49-60); providing a first pseudo bit-error signal from a comparer that is a result of comparison of data sampled at an early boundary with recovered data (figure 3

blocks 33 and 35 column 3 line 49 to column 4 line 13); providing a second pseudo bit-error signal from the comparer that is a result of comparison of data sampled at a late boundary with recovered data (figure 3 blocks 33 and 35 column 3 line 49 to column 4 line 13); and using the first and second pseudo bit-error signals, so that the sampling boundary is marginally matched to the edge of an eye opening and one of the intermediate sampling points serves for data recovery (figure 3 blocks 33 and 35 column 3 line 49 to column 4 line 13).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1-8 and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergmann (US 4821297) in view of Hogge (US 4218771).

As per claim 1, Bergmann discloses a data recovery apparatus for a digital data stream of input data, comprising phase shifting means for outputting a plurality of sampling clocks in a bit time, where the phase of each sampling clock of the plurality of sampling clocks are automatically adjustable (abstract; figure 6 blocks 16, 14 and 38; column 3 line 67 to column 4 line 8; column 7 line 21-40; and column 9 lines 42-56. Bergmann uses the same expression that the Applicant's disclosure he discloses that the clocks are adjustable); data sampling means for sampling the input data using the sampling clocks as triggers, and for providing multiple sampled data signals, where one

of the sampled data signals is used to output recovered data (figure 6 blocks 32, 34 and 36, column 7 line 18-21); compare logic means for comparing the sampled data signals to the recovered data (figure 6 block 20, column 7 line 41-45); and phase controlling means for estimating the phase relationship between the input data and the plurality of sampling clocks, and for providing control signals to the phase shifting means according to the estimation result (figure 6 block 20, column 7 line 41-45). Bergmann doesn't specifically disclose providing at least a first pseudo-bit error value and a second pseudo-bit error value; and using at least the first pseudo-bit error value and the second pseudo-bit error value, for providing control signals to the phase shifting means. Hogge discloses providing at least a first pseudo-bit error value and a second pseudo-bit error value (figure 3 blocks 33 and 35 column 3 line 49 to column 4 line 13); and using at least the first pseudo-bit error value and the second pseudo-bit error value, for providing control signals to a phase shifting means (figure 3 block 57 column 3 line 49 to column 4 line 13). Bergmann and Hogge teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the automatic clock positioning disclosed by Hogge with the recovery scheme disclosed by Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge abstract). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claim 1.

As per claim 2, Bergmann and Hogge disclose claim 1. Bergmann also discloses that the phase shifting means comprise phase delay means controlled by a first output of the phase controlling means for outputting a first sampling clock of the plurality of sampling clocks using an input clock which is one of an external clock and an internally recovered clock (figure 6 block 14, column 3 line 31-34); first circuit means controlled by a second output of the phase controlling means for outputting a second sampling clock of the plurality of sampling clocks that advances the first sampling clock in phase (figure 6 block 38, column 7 line 26-28); second circuit means controlled by the second output of the phase controlling means for outputting a third sampling clock of the plurality of sampling clocks that is delayed from the first sampling clock in phase (figure 6 block 20, column 7 line 24-25). Hogge also discloses that the phases of the three sampling clocks are arranged within an eye opening of the input data stream with a predetermined margin (figure 2 and 3, column 3 line 49-51). Bergmann and Hogge teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the automatic clock positioning disclosed by Hogge with the recovery scheme disclosed by Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge abstract). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claim 2.

As per claim 3, Bergmann and Hogge disclose claim 2. Bergmann also discloses that the first circuit means and the second circuit means receive the first sampling clock

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(figure 1 and 6 block 16, column 3 line 22-26). Bergmann and Hogge teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the automatic clock positioning disclosed by Hogge with the recovery scheme disclosed by Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge abstract). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claim 3.

As per claim 4, Bergmann and Hogge disclose claim 1. Bergmann also discloses that the phase shifting means comprises a phase distributor outputting a plurality of phase shift values (figure 6 block 38, column 7 line 21-40); a buffer receiving input from the phase distributor and outputting a first sampling clock of the plurality of sampling clocks in accordance with a first output of the phase controlling means (figure 1 and 6 block 14 and 38 output, column 3 line 31-35); and selection logic receiving input from the phase distributor and outputting a second and third sampling clock of the plurality of sampling clocks in accordance with a second output of the phase controlling means (figure 6 block 38, column 7 line 21-22). Bergmann and Hogge teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the automatic clock positioning disclosed by Hogge with the recovery scheme disclosed by Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge

abstract). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claim 4.

As per claim 5, Bergmann and Hogge disclose claims 1. Bergmann also discloses that the phase shifting means comprises a voltage controlled oscillator controlled by a first output of the phase controlling means, circuit means controlled by a second output of the phase controlling means for outputting three sampling clocks by delaying the output of the voltage controlled oscillator (figure 6 block 16 column 3 lines 34-37; and figure 6 block 38 column 7 lines 13-57). Hogge also discloses that the phases of the three sampling clocks are arranged within an eye opening of input data stream with a predetermined margin (figures 1-3 column 3 line 6 to column 4 line 13). Bergmann and Hogge teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the automatic clock positioning disclosed by Hogge with the recovery scheme disclosed by Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge abstract). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claim 5.

As per claim 6, Bergmann discloses a data recovery apparatus for a digital data stream of input data, comprising a phase shifter that outputs a plurality of sampling clocks in a bit time, where the phase of the plurality of sampling clocks are adjustable (abstract; figure 6 blocks 16, 14 and 38; column 3 line 67 to column 4 line 8; column 7

line 21-40; and column 9 lines 42-56. Bergmann uses the same expression that the Applicant's disclosure he discloses that the clocks are adjustable); a data sampler that samples the input data using the sampling clocks as triggers, and for providing multiple sampled data signals, where one of the sampled data signals is used to output recovered data (figure 6 blocks 32, 34 and 36, column 7 line 18-21); compare logic that compares the sampled data signals to the recovered data (figure 6 block 20, column 7 line 41-45); and a phase controller that estimates the phase relationship between the input data and the plurality of sampling clocks for providing control signals to the phase shifter according to the estimation result (figure 6 block 20, column 7 line 41-45).

Bergmann doesn't specifically disclose providing at least a first pseudo-bit error value and a second pseudo-bit error value; and using at least the first pseudo-bit error value and the second pseudo-bit error value, for providing control signals to the phase shifting means. Hogge discloses providing at least a first pseudo-bit error value and a second pseudo-bit error value (figure 3 blocks 33 and 35 column 3 line 49 to column 4 line 13); and using at least the first pseudo-bit error value and the second pseudo-bit error value, for providing control signals to a phase shifting means (figure 3 block 57 column 3 line 49 to column 4 line 13). Bergmann and Hogge teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the automatic clock positioning disclosed by Hogge with the recovery scheme disclosed by Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge abstract).

Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claim 6.

As per claim 7, Bergmann and Hogge disclose claim 6. Bergmann also discloses that the phase shifter comprises phase delay logic controlled by a first output of the phase controller for outputting a first sampling clock of the plurality of sampling clocks using an input clock which is one of an external clock and an internally recovered clock (figure 6 block 14, column 3 line 31-34); first circuit controlled by a second output of the phase controller for outputting a second sampling clock that advances the first sampling clock of the plurality of sampling clocks in phase (figure 6 block 38, column 7 line 26-28); a second circuit, controlled by the second output of the phase controller for outputting a third sampling clock of the plurality of sampling clocks that is delayed from the first sampling clock in phase (figure 6 block 20, column 7 line 24-25). Hogge also discloses that the phases of the three sampling clocks are arranged within an eye opening of the input data stream with a predetermined margin (figure 2 and 3, column 3 line 49-51). Bergmann and Hogge teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the automatic clock positioning disclosed by Hogge with the recovery scheme disclosed by Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge abstract). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claim 7.

As per claim 8, Bergmann and Hogge disclose claim 6. Bergmann also discloses that the phase shifter comprises a voltage controlled oscillator controlled by a first output of the phase controller, a circuit, controlled by a second output of the phase controller for outputting three sampling clocks by delaying the output of the voltage controlled oscillator (figure 6 block 16 column 3 lines 34-37; and figure 6 block 38 column 7 lines 13-57). Hogge also discloses that the phases of the three sampling clocks are arranged within an eye opening of input data stream with a predetermined margin (figures 1-3 column 3 line 6 to column 4 line 13). Bergmann and Hogge teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the automatic clock positioning disclosed by Hogge with the recovery scheme disclosed by Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge abstract). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claim 8.

As per claims 10 and 12, Bergmann and Hogge disclose claims 1 and 6. Bergmann also discloses that the phase of each sampling clock of the plurality of sampling clocks are automatically adjustable (abstract; figure 6 blocks 16, 14 and 38; column 3 line 67 to column 4 line 8; column 7 line 21-40; and column 9 lines 42-56. Bergmann uses the same expression that the Applicant's disclosure he discloses that the clocks are adjustable). Hogge also discloses automatically adjust the phase of the sampling clocks (title, column 1 lines 6-8, column 2 lines 66-68 and claims 1-7).

Bergmann and Hogge teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the automatic clock positioning disclosed by Hogge with the recovery scheme disclosed by Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge abstract). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claims 10 and 12.

As per claims 11 and 13, Bergmann and Hogge disclose claims 10 and 12. Hogge discloses a time distance between a first-occurring clock of the plurality of clocks and a last-occurring clock of the plurality of clocks is automatically adjustable (abstract; column 2 lines 42-44; figures 1-3 the time distance between the three clocks is 2Δ ; column 3 line 6 to column 4 line 13. Hogge expressly indicates that the adjustment is automatic in the title, column 1 lines 6-8, column 2 lines 66-68 and claims 1-7). Bergmann and Hogge teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the automatic clock positioning disclosed by Hogge with the recovery scheme disclosed by Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge abstract). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claims 11 and 13.

As per claim 14, Bergmann and Hogge disclose claim 6. Bergmann also discloses a first latch operable coupled to receive a first clock signal, the first latch capable of providing a first sample of data (figure 6 block 32 column 7 line 13-57); a second latch operable coupled to receive a second clock signal, the second latch capable of providing a second sample of data (figure 6 block 34 column 7 line 13-57); and a third latch operable coupled to receive a second clock signal, the third latch capable of providing a third sample of data (figure 6 block 36 column 7 line 13-57). Bergmann and Hogge teachings are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the automatic clock positioning disclosed by Hogge with the recovery scheme disclosed by Bergmann. The suggestion/motivation for doing so would have been to continuously optimized the phase of the clock timing pulses relatively to the received signal (Hogge abstract). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claim 14.

Claims 15-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergmann and Hogge as applied to claim 14 above, and further in view of Williams (US 5455540 A).

As per claim 15, Bergmann and Hogge disclose claim 14. Bergmann and Hogge don't specifically disclose that each of the comparator comprises a XOR gate operable coupled to receive the sample of data. It is well known the use of XOR gates as logic comparators, and Williams a first XOR gate operable coupled to receive a first sample

of data and a second sample of data, the first XOR gate capable of providing a first comparison output, and a second XOR gate operable coupled to receive the third sample of data and the second sample of data, the second XOR gate capable of providing a second comparison output (figure 1 blocks 102 and 112; column 4 line 61 to column 6 line 14). Bergmann, Hogge and Williams are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the phase detector disclosed by Williams with the recovery scheme disclosed by Bergmann and Hogge. The suggestion/motivation for doing so would have been to reduce the error in long periods interval between transition edges (column 4 lines 6-14). Therefore, it would have been obvious to combine Hogge with Bergmann to obtain the invention as specified in claim 15.

As per claim 16, Bergmann, Hogge and Williams disclose claim 15. Williams also discloses a first latch operable coupled to receive the first comparison output, the first latch capable of providing a first latched output, and a second latch operable coupled to receive the second comparison output, the second latch capable of providing a second latched output (figure 1 blocks 103 and 113; column 4 line 61 to column 6 line 14). Bergmann, Hogge and Williams are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the phase detector disclosed by Williams with the recovery scheme disclosed by Bergmann and Hogge. The suggestion/motivation for doing so would have been to reduce the error in long periods interval between transition

edges (Williams column 4 lines 6-14). Therefore, it would have been obvious to combine Williams with Hogge and Bergmann to obtain the invention as specified in claim 16.

As per claim 17, Bergmann, Hogge and Williams disclose claim 16. Williams also discloses a first phase estimator operable coupled to receive the first latched output and the second latched output, the first phase estimator capable of providing a first phase estimate output, and a second phase estimator operable coupled to receive the first latched output and the second latched output, the second phase estimator capable of providing a second phase estimate output (figure 1 blocks 121 and 122; column 6 lines 15-59). Bergmann, Hogge and Williams are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the phase detector disclosed by Williams with the recovery scheme disclosed by Bergmann and Hogge. The suggestion/motivation for doing so would have been to reduce the error in long periods interval between transition edges (Williams column 4 lines 6-14). Therefore, it would have been obvious to combine Williams with Hogge and Bergmann to obtain the invention as specified in claim 17.

As per claim 18, Bergmann, Hogge and Williams disclose claim 17. Hogge also discloses a first loop filter operable coupled to receive said first phase estimate output, said first loop filter capable of providing a first filtered output (figure 4 block 69 column 5 lines 1-20); and a second loop filter operable coupled to receive said second phase estimate output, said second loop filter capable of providing a second filtered output

(figure 4 block 91 column 5 lines 1-20). Bergmann, Hogge and Williams are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the phase detector disclosed by Williams with the recovery scheme disclosed by Bergmann and Hogge. The suggestion/motivation for doing so would have been to reduce the error in long periods interval between transition edges (Williams column 4 lines 6-14). Therefore, it would have been obvious to combine Williams with Hogge and Bergmann to obtain the invention as specified in claim 18.

As per claim 19, Bergmann, Hogge and Williams disclose claim 18. Hogge also discloses that the phase shifter is operable coupled to receive the output capable of providing the first clock signal, the second clock signal, and the third clock signal (figure 3 block 57 column 3 line 49 to column 4 line 13). Bergmann, Hogge and Williams are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the phase detector disclosed by Williams with the recovery scheme disclosed by Bergmann and Hogge. The suggestion/motivation for doing so would have been to reduce the error in long periods interval between transition edges (Williams column 4 lines 6-14). Therefore, it would have been obvious to combine Williams with Hogge and Bergmann to obtain the invention as specified in claim 19.

As per claim 20, Bergmann, Hogge and Williams disclose claim 17. Williams also discloses that the first phase estimate output is the difference between the first latched output and the second latched output (figure 1 block 121; column 6 lines 15-59).

Bergmann, Hogge and Williams are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the phase detector disclosed by Williams with the recovery scheme disclosed by Bergmann and Hogge. The suggestion/motivation for doing so would have been to reduce the error in long periods interval between transition edges (Williams column 4 lines 6-14). Therefore, it would have been obvious to combine Williams with Hogge and Bergmann to obtain the invention as specified in claim 20.

As per claim 21, Bergmann, Hogge and Williams disclose claim 20. Williams also discloses that the second phase estimate output is the sum of the first latched output and the second latched output (figure 1 block 122; column 6 lines 15-59). Bergmann, Hogge and Williams are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the phase detector disclosed by Williams with the recovery scheme disclosed by Bergmann and Hogge. The suggestion/motivation for doing so would have been to reduce the error in long periods interval between transition edges (Williams column 4 lines 6-14). Therefore, it would have been obvious to combine Williams with Hogge and Bergmann to obtain the invention as specified in claim 21.

Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergmann, Hogge and Williams as applied to claims 17 and 20 above, and further in view of Hogge (US 4538283 A).

As per claim 22, Bergmann, Hogge and Williams disclose claim 17. Hogge and Williams don't disclose that the first phase estimate output is the weighted difference between the first latched output and the second latched output. Hogge discloses that the first phase estimate output is the weighted difference between the first latched output and the second latched output (figure 1 overcompensate block; column 1 lines 34-54 and column 2 lines 37-52). Bergmann, Hogge, Williams and Hogge are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the weighting process disclosed by Hogge with the recovery scheme disclosed by Bergmann, Hogge and Williams. The suggestion/motivation for doing so would have been to compensate for distortion in the transmission medium (column 1 lines 34-54). Therefore, it would have been obvious to combine Hogge with Bergmann, Hogge and Williams to obtain the invention as specified in claim 22.

As per claim 23, Bergmann, Hogge and Williams disclose claim 20. Hogge and Williams don't disclose that the second phase estimate output is the weighted sum of the first latched output and the second latched output. Hogge discloses that the second phase estimate output is the weighted sum of the first latched output and the second latched output (figure 1 overcompensate block; column 1 lines 34-54 and column 2 lines 37-52). Bergmann, Hogge, Williams and Hogge are analogous art because they are from the same field of endeavor. At the time of the invention it would have been obvious to a person of ordinary skill in the art to incorporate the weighting process disclosed by Hogge with the recovery scheme disclosed by Bergmann, Hogge and

Williams. The suggestion/motivation for doing so would have been to compensate for distortion in the transmission medium (column 1 lines 34-54). Therefore, it would have been obvious to combine Hogge with Bergmann, Hogge and Williams to obtain the invention as specified in claim 23.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juan A. Torres whose telephone number is (571) 272-3119. The examiner can normally be reached on Monday-Friday 9:00 AM - 5:00 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

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Juan Alberto Torres
01-30-2006


KEVIN BURD
PRIMARY EXAMINER